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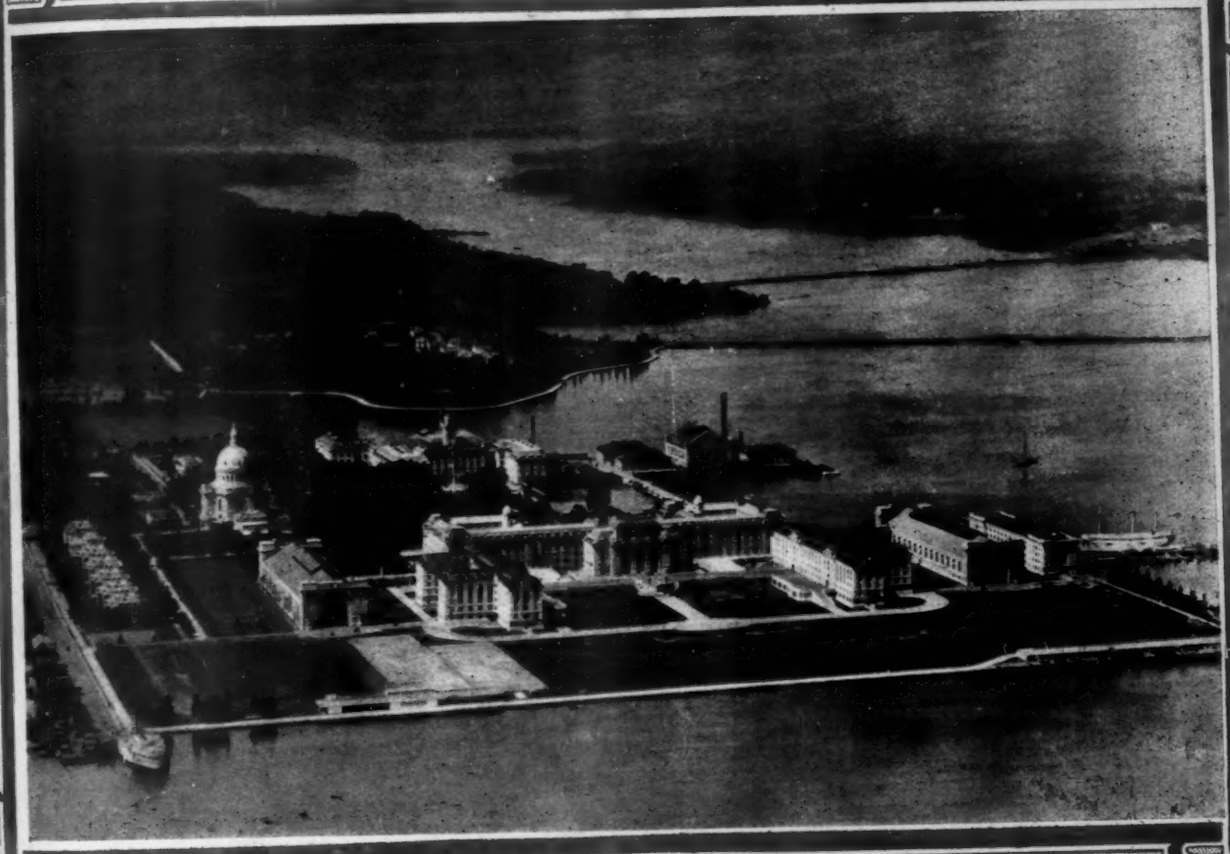

U. S. Naval Academy, Annapolis, Md.

VOLUME XIII
Number 5

SPECIAL FEATURES

M.I.T. GLIDER AT FRENCH COMPETITION
AN EXPLANATION OF SOARING FLIGHT
AFRICAN CRUISE OF A ZEPPELIN
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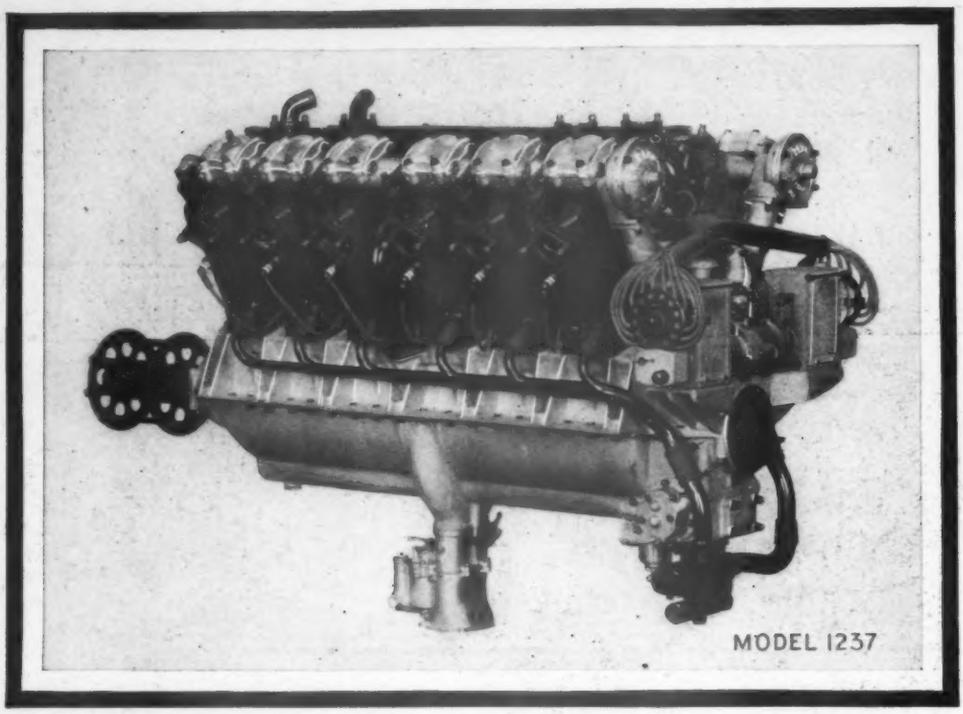

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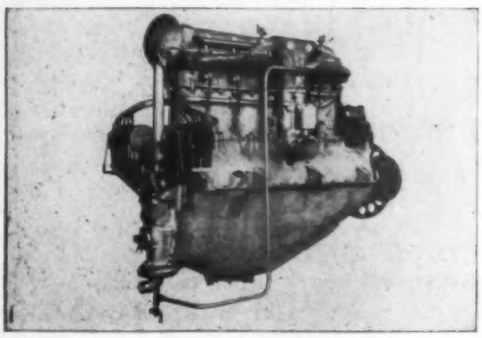

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JULY 31, 1922

AVIATION

VOL. XIII. NO. 5

Member of the Audit Bureau of Circulations

CONTENTS

Editorials	119	The Chicago Flying Meet	128
M.I.T. Gliders at French Competition	120	Airport at Walla Walla	128
An Explanation of Soaring Flight	121	G. B. Balloon Team Sails	129
Night Air Mail Planned	123	New Crash Proof Tank	129
Rio to Lisbon Flight Completed	123	The Detroit Aviation Meet	129
New Wright Engines for Naval Aviation	124	Goodyear Gets Large Contract	130
Foolish Stunts	125	American Aviation Forging Ahead	130
Air Service Develops Airways Program	126	Warning to Aviators	130
The African Cruise of Zeppelin L59	127	Army and Navy Air News	131
Automotive Export Campaign	127	Coming Aeronautical Events	133
Safety Record of Air Mail	128	Foreign News	134
Trade Notes	128		

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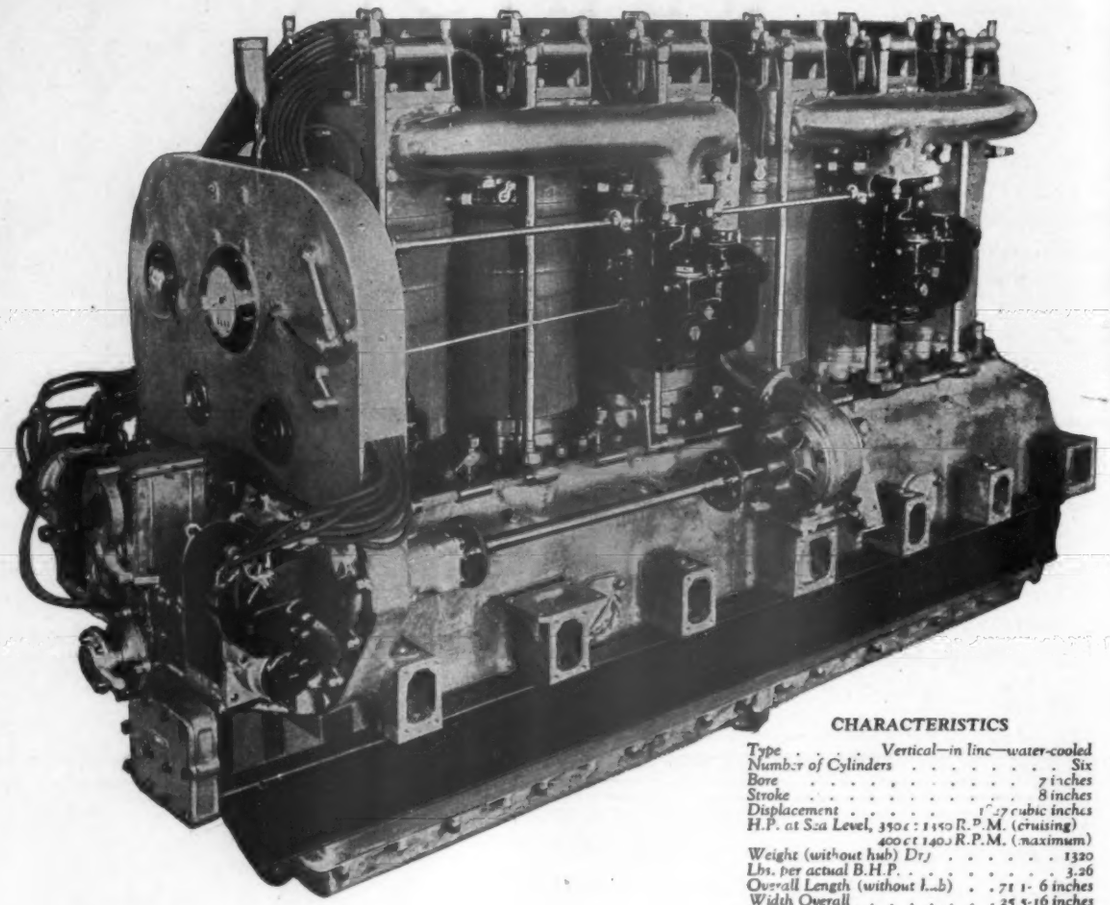

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Type	Vertical—in line—water-cooled
Number of Cylinders	Six
Bore	7 inches
Stroke	8 inches
Displacement	1827 cubic inches
H.P. at Sea Level, 3300 ft.	1150 R.P.M. (cruising)
	400 ft 1400 R.P.M. (maximum)
Weight (without hub) Dry	1320
Lbs. per actual B.H.P.	3.26
Overall Length (without hub)	71 1-16 inches
Width Overall	25 5-16 inches
Height (engine bearer to top)	31 11-16 inches
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Vol. XIII JULY 31, 1922 No. 5

The Night Air Mail

THE announcement by the Post Office Department that it expects to put night service in operation on the transcontinental air mail route before the end of the present fiscal year, that is, before June 30, 1923, is a step in the right direction for developing commercial aviation.

Those who have studied the various problems underlying civil air transport are agreed that its greatest immediate utility is to be expected, first, from long distance routes, and second, from day and night flying. These two factors are really interrelated, for the long distance routes in question are as a rule the ones which necessitate night flying if the service is to afford all the advantages of speed aircraft confer upon its users.

The organization of airways for night flying is a complex problem, and the Air Mail Service is to be congratulated for the serious, conservative manner in which they are tackling it, taking every precaution to make night flying as safe as possible rather than rushing to be the first to fly by night.

The Paris-London airway is now equipped for night flying, and some experimental night flights have successfully been accomplished—but that route is only 240 miles long as against the 2680 miles of our transcontinental airway, which is furthermore handicapped by some serious natural obstacles, such as the Alleghanies and the Rocky Mountains. It is estimated that for the New York-San Francisco airway emergency landing fields equipped with powerful beacons will be needed every 25 miles, which means that there will be sixty-eight landing stations of one kind or another on this route. From this the magnitude of the enterprise may be grasped.

The splendid record of safety achieved by the Air Mail Service during the past twelve months—in which it carried 49,000,000 letters over a total distance of 1,750,000 miles without a single fatal accident and defaulted only 7½ per cent of its scheduled trips—is a brief that when night flying will be inaugurated on the New York to San Francisco airway, it will be operated with the same regard for safety and efficiency which has made the American Air Mail justly famous throughout the world.

Air Trespass

AN interesting case of so called air trespass has recently come before the courts of Pennsylvania. Some gypsy fliers rented a tract of land which they used for a flying field. The owner of the adjoining farm objected to the noise of the airplanes flying over his property and brought an action for trespass. The Justice of the Peace fined the aviators $1.00 each. A few days later the decision was reversed by a judge who held that, as the airmen had not set foot on the complainant's ground, they had not violated the existing trespass act. It was also indicated that there was no trespass law in Pennsylvania under which airmen could be fined.

The question of the ownership of the air, while never finally adjudicated in this country seems to be obvious from common usage. Ever since the rights of property have been established the use of the air by birds, bees and carrier pigeons, regardless of their ownership, has not been questioned. Even polluting the air by chemical plants has been permitted. Now, radio is establishing another precedent by zoning the air for different classes of wave lengths.

"Who owns the Air" is a question that has been discussed from many points of view. While the unobstructed and peaceful use of the air has always rested in the owner of land, the right of tenancy has never been extended to prevent the free use of the air above property. No owner of land has ever prevented the public from looking or hearing through the air above his property and the very mention of this prohibition sounds absurd.

The Convention for the Regulation of Air Navigation as signed by the United States and practically all the leading nations of the world states under "General Principles": "The high contracting Parties recognize that every Power has complete and exclusive sovereignty over the air above its territory." While this may apply only to international relations, it is obvious that the regulations for the use of the air must rest in the federal government alone.

The right of eminent domain has long been the method of acquiring for public use, rights of way and land for any public betterments so that no matter what legal quibbling may cloud the broad issue, it will always be possible for the government to obtain control of the air. "Free as the air" is no longer a maxim but is becoming a reality sanctioned by law.

The sea has always been free. A leading legal authority has stated "The sea is an element which belongs to all men like the air."

It will be unfortunate if a case involving exhibition flying, where noise of planes and the nuisance from crowds brings in the question of local police power is used to influence public sentiment about the fundamental freedom of the right of way through the air for commercial air transportation.

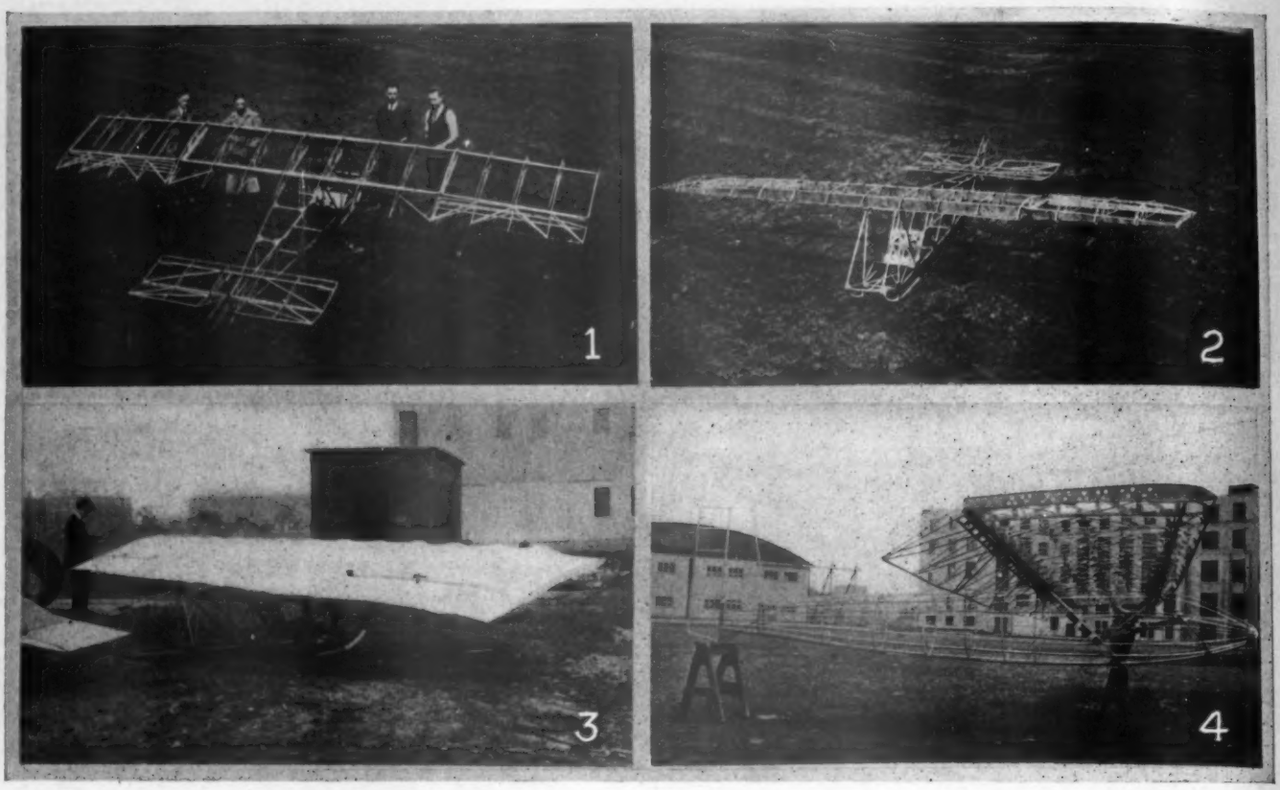
Continuing Airship Development

IT is gratifying to learn that the Army Air Service has placed with the industry an order for six airplanes designed to be filled with helium. While five of these ships will merely be enlarged versions of the standard twin-engined types, to compensate for the difference in lifting power between hydrogen and helium, the sixth ship will be of an entirely new type, of fairly large size and embodying semi-rigid principles of construction.

As the latter vessel is admittedly destined to be an experimental airplane carrying airship, it will be seen that the Air Service is consistently carrying out its program of neglecting no phase of aviation which may be useful to national defense.

M.I.T. Gliders at French Competition

American Team Sails with Two Machines Entered in French Gliding Competition at Puy-de-Combegrasse



Views of the American entries in the French gliding competition: Figs. 1 and 2—M.I.T. glider No. 1, uncovered; Fig. 3—the same, covered; Fig. 4—skeleton of the M.I.T. glider No. 2

American aviation will be actively represented at the Experimental Congress of Motorless Flight which the French Aerial Association and the Aero Club of Auvergne will jointly hold from Aug. 6-20, next, at the Puy-de-Combegrasse, near Clermont-Ferrand, France. Two gliders built by the Aeronautical Engineering Society of the Massachusetts Institute of Technology have been entered in the French competition, and are now on their way to France together with the American gliding team, composed of Edmund T. Allen, age 26, of Chicago; Harry C. Karcher, age 20, of Mansfield, Ohio, and Otto C. Koppen, age 22, of Mamaroneck, N. Y. Mr. Allen, who was formerly a test pilot for the Army Air Service at McCook Field, Dayton, Ohio, is the pilot. The chief designing work, with the assistance of the Aeronautical Society, was done by Mr. Koppen, while Mr. Karcher had charge of the practical construction of the glider.

Messrs. Allen, Karcher and Koppen constructed a glider at the M.I.T. laboratories and, as has been reported before in AVIATION, on June 12, Mr. Allen took it to a 50-ft. elevation at Isswich, Mass. He rose in a fifteen mile head wind. Altogether five successful flights were made. The velocity of the wind was such that the machine hovered practically the entire time. It reached a maximum elevation of 20 ft. and advanced a maximum distance, in one flight, of 200 ft.

As the result of these trials the three experimenters designed, with the assistance of other members of the Aeronautical Engineering Society of M.I.T., a second glider, which embodies some of the lessons learned in the operation of the initial machine. M.I.T. glider No. 2, which is shown above in skeleton form, is 24 ft. in span, 16 ft. in overall length, and weighs 80 lb. The safety factor is 4. The new machine embodies some features novel in glider construction, such as flaps extending the entire span of the wings, whereby the camber can be decreased or increased at will by the pilot, and a very effective type of camber control which it is not considered advisable to describe at the present time.

As may be seen from the above illustration, Glider No. 2 is much better streamlined than No. 1, and more ample tail control surfaces are provided for. The landing gear is also of a novel and interesting type.

According to our contemporary *Les Ailes*, there were thirty-six entries in the competition on June 15, one month before the closing date, and it was then expected that several aircraft manufacturers would enter machines in the last moment.

According to the latest advice from the organization committee, the following new entries have been received in addition to the sixteen listed in the June 12 issue of AVIATION:

17. Gustave Thourouss.
18. Daniel Montagne.
19. Farman Frères.
20. Henri Grandin.
21. J. Rollé.
22. Maurice Rousset.
23. Henry Potez.
24. Georges Sablier.
25. P. O. Detable.
26. Louis Peyret.
27. Aimé Valette.
28. Ettore Bernasconi.
29. Maurice Griffrath.
30. Lucien Lefort.
31. Pierre Vial.
32. J.P. Trofin.
33. Louis Bréguet.
34. Georges Julien.
35. Maurice Aubiet.
36. Jules Caux.
37. Bellanger Frères.
38. Robert Landes.
39. M.I.T.
40. Louis Clément.

Of the first thirty-six entries twenty-six are gliders; nine are *aviettes*, or flying bicycles; and one is a "muscular" helicopter. Particulars of these machines will be given in a subsequent issue of AVIATION.

An Explanation of Soaring Flight

Condensed Outline of a Series of Lectures Delivered before the Northwest Aeronautical Society, Seattle, Wash.

By J. W. Miller

For many years writers on the subject of bird flight assumed that because the bones of birds were hollow, they were filled with gas, thereby making the bird lighter than air, so that it floated in the air very much as a balloon floats. Although this theory was accepted for many years, a little thought readily proved the absurdity of it.

Another theory advanced some fifty years ago was that birds have the power through an almost invisible quivering of their feathers to render themselves highly anti-gravitational. It is rather strange to note that this belief is even yet adhered to by some so-called investigators.

The Theory of Ascending Currents

One of the early theories that still prevails and finds many adherents is the theory of ascending currents of air. Since this belief is quite general among students of bird flight, and is accepted by many earnest investigators, it seems necessary to discuss it at some length.

Anyone who has taken a journey by water along the coasts of North America could not have but been impressed with the soaring flight of the common sea-gull (Larus glaucescens).

Figure 1

These gulls frequently follow ships for many miles, soaring the greater part of the journey. This performance has been explained by the adherents of the ascending air theory by the statement that the heat from the vessel causes rising currents of air. If this be accepted as a true explanation, then it would seem that we should attempt to explain why these birds do not fly above and aft of the funnels of the steamer. Also how they soared before the advent of the steamship.

It has been stated further that vultures and turkey buzzards fly over open country in the summer time because the heated air from such country rises in a continual flow. It has been the writer's observation that such birds are usually to be found soaring about in the vicinity of dead animals or other carrion. It is scarcely to be supposed that such carrion is to be found only in regions of ascending air currents. It is also noticeable that these birds soar at very great heights. This doubtless is due to the bird's attempts to rise above the ascending currents coming from the heated areas below.

Again, one of the best soarers is the albatross. This bird is scarcely ever observed to flap its wings, and yet it will follow a ship for days across the ocean, regulating its speed to that of the ship. It would seem that the adherents of the theory of ascending air currents would need to explain how such currents could be possible over any particular portion of the ocean which might be chosen at random.

Furthermore, if we accept the theory of ascending air currents we must not overlook the fact that air will flow upward because it is lighter than the body of air immediately surrounding it, or because it is deflected upward by an obstruction. If the upward flow is due to heavier air surrounding the rising column, then a heavier-than-air machine entering such an upward flow would immediately descend, due to the lesser density. Any pilot who has flown over arid or semi-arid country can testify to the fact that a plane on entering such a region will lose altitude until it has gained sufficient speed to again attain its former lift.

Other Discrepancies

If a vertically ascending column of air is to serve any purpose in lifting the airplane it can do so in one of two ways; either by flowing upward with such velocity that it forces the plane up dynamically, or by virtue of the fact that the plane would need to be lighter than the air itself and would thus be floated upward. Neither of these conditions exist.

Figure 2

If the air is deflected upward, due to encountering an obstruction in its path, then its upward trend is at a comparatively small angle with the horizon. The effect on a plane entering such a flow of air would be a tendency to stall, due to the fact that if it were flying at its best angle of incidence the upward trend of the air would increase this angle of incidence appreciably, and up to the burble point would increase the lift; but upon passing the burble point or point of maximum lift, or say about 18 deg. angle of incidence, the plane would promptly stall. This being the case it would be necessary to nose down. It would seem that some other explanation of soaring flight would be necessary.

It was the writer's privilege to construct machines more than twenty-five years ago from the data derived by Professor Langley and he is of the opinion that Langley's work on the internal work of the wind is the true explanation of soaring flight when taken in connection with the condition for stability of an airplane in flight. Most attempts to outline a means by which soaring flight can be accomplished include a large degree of inherent stability. This is fundamentally wrong and can easily be shown to defeat its own purpose.

I will attempt to show here how soaring flight is accomplished, how simple it is, and how difficult it becomes when inherent stability is made the *summum bonum*.

A Simple Example

Let us first investigate some of the common forms of locomotion provided by nature. Take for example a man walking.

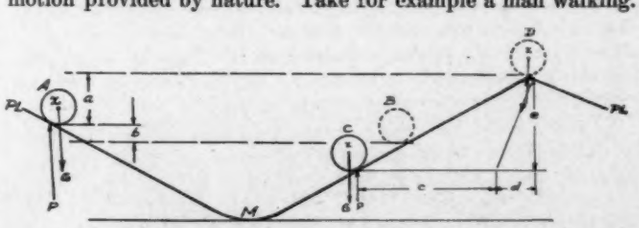


Figure 3

It would be difficult to conceive of a more unstable condition than this. The center of gravity of the body is high above the point of support and it is only for a very brief space of time (if at all) that this point of support is directly under the center of gravity. Reference to Fig. 1 will make this clear. The lower portion of the sketch shows the man in elevation. *C* is his center of gravity, while *P* is the point of

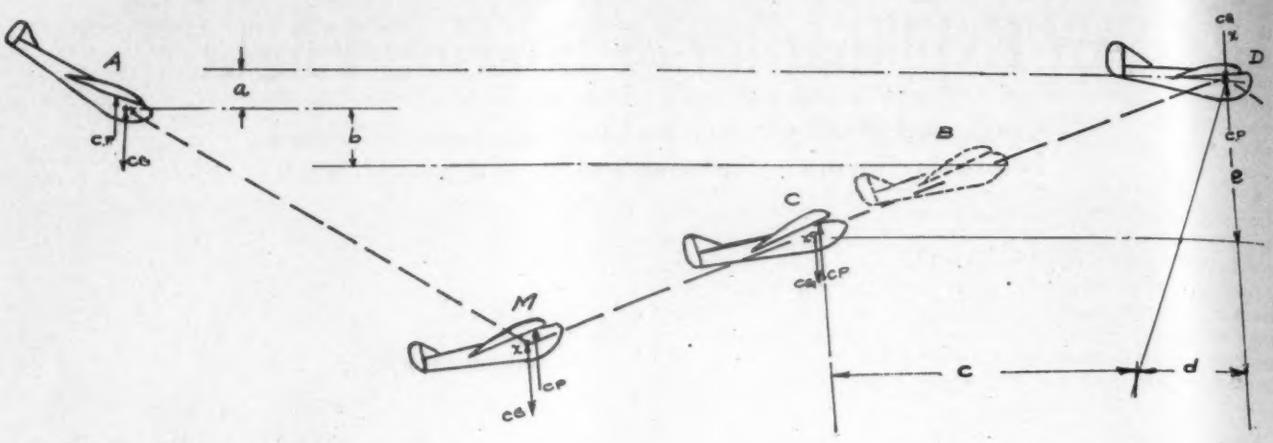


Figure 4

support. Thus it will be seen that in elevation the center of gravity is in advance of the point of support *P*. *A A'* is the path of the center of gravity. Were *C* to remain vertically above *P*, the body would be stable, but no motion would take place so long as this condition remained undisturbed.

In the upper portion of the figure is shown the plan view in which *AA'* is the path described by the center of gravity *C*, while *PPP* are the points of support. It will thus be seen that in walking there is no position where the body is in stable equilibrium.

Another Example

In Fig. 2 is shown in plan the path of the center of gravity of the body of a skater. As before *AA'* represents the path of the center of gravity of the body. *SSS* are the marks of skates, or the travel of the center of support. From the diagram it will be noted that in each stroke of the skate there is one point of equilibrium, viz. at the point where the path of the center of gravity crosses the skate mark. At this point, however, the inertia of the body carries the weight beyond the point of equilibrium and the skate turns away from the falling body, thus placing the system of forces in a very unstable position.

As all skaters know, it is a very simple matter to skate without lifting either foot from the ice. To one wholly unacquainted with the art of skating this would be extremely baffling. It would be as logical for such an individual to look for some mysterious force in the skates, or to assume that this manner of skating was due to a downward inclination of the ice, as it is to attempt to explain bird flight by an anti-gravitational theory or by a belief in ascending air currents.

One of the most remarkable circumstances in the growth of civilization has always been man's propensity to attempt to explain what he does not understand, in some mysterious and highly improbable manner. After blundering along for a period of time in this way he gradually begins to study and experiment, ultimately arriving at the correct solution. After having reached the correct solution he sits back and complacently marvels at the simplicity of it. Thus it seems that the many unsuccessful attempts to explain soaring flight is merely history in the act of repeating itself.

In the present instance it is not necessary to look for new or unknown forces or processes. We can solve our problem in a simple and direct manner, making use of well understood and long known laws.

In Fig. 3 is shown a ball at point *A* in motion down an inclined plane *PL; G* is an arrow through the center of gravity *X; P* is the point of support. Since *X* is above and in advance of *P*, the force of gravity will produce motion downward and toward the right. The momentum thus acquired would carry the ball to *B*. However, when the ball is at *C* and still moving, if the inclined plane be suddenly and vigorously moved toward the left a distance *c*, the ball will be forced to position *D* or through a vertical height *e*, which is a distance *a* higher than it originally started from. The distance *b* represents the loss in height (potential energy head) due to air and frictional resistance, while $a + b$ is the energy or head imparted to the ball, or consumed in moving the inclined plane toward the left. The distance *d* represents the horizontal distance the ball would have traveled from *C* to *B* under its own momentum had no motion of the inclined plane taken place.

Note that in position *C* the center of gravity is at the left of the point *P* and the ball is in an unstable position. Were it to stop at this point motion would take place toward the left. In moving from position *A* to position *C* the ball has passed through a position of static equilibrium and only its momentum carries it toward the right. In position *D* the ball is in equilibrium and no further motion would take place unless the condition here prevailing be disturbed by some external force.

The Mechanism of Soaring Flight

Let us now substitute for the ball a soaring machine and for the inclined plane *PL* a homogenous body of still air. In Fig. 4, if the center of gravity *X* of the soaring machine be in advance of its center of pressure *P*, it will glide downward and reach the point *M* with considerable momentum. If at point *M* the center of gravity and center of pressure be interchanged the machine will "nose up" and its momentum would carry it to position *B*.

If, however, while the machine is at some point as *C*, a wind moving in the opposite direction (or toward the left) strike it, it will be lifted through the height *e*, and its momentum will carry it to *D*. If, when the machine has reached *D*, the wind cease and at the same time the center of gravity be shifted ahead of the center of pressure, a forward glide will

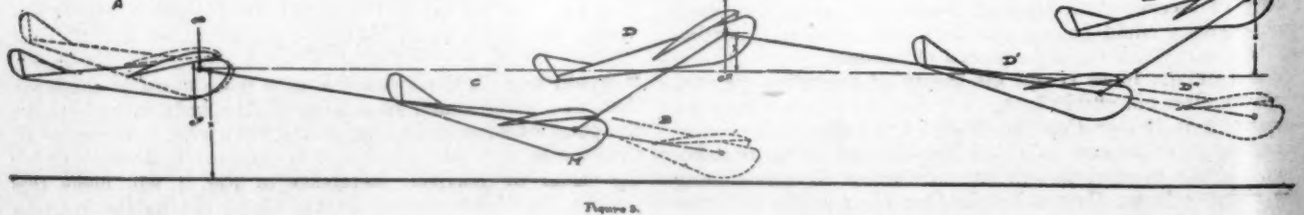


Figure 5.

again take place. It is obvious that if at any point along the path of the upward glide the machine be nosed down, it will glide downward and forward even though the wind continue to blow. It should be noted that if the center of gravity be in the vertical plane through the center of pressure, no forward motion would take place at *D* and the machine would pancake; or if the wind continued it would be blown backward.

It thus appears that the irregular flow of the air, called by Professor Langley the "internal work" of the wind, is an important aid to soaring flight. However it must not be forgotten that even though the wind blow with exact regularity it still possesses kinetic energy which can be utilized for soaring by the correct manipulation of a properly designed machine. It is only necessary to nose down at any point in an upward glide and thus gain speed relative to the flow of air.

Practical Soaring

In Fig. 5 a soaring machine at *A*, at a distance *X* above the ground, is moving forward into the wind and would land at *B*. At *C* the controls are manipulated to cause the machine to nose up thereby bringing it to point *D*. Assuming that it has a properly selected aerofoil and that the machine has not been placed in a stalling position, the increase in the angle of incidence will increase the lift much faster than it will increase the drag. The machine will therefore be lifted to *D* under the combined action of the wind and its own inertia. At *D* the machine passes through a position of stability in the process of nosing down and would pancake were it not placed at a downward inclination. This downward inclination would carry it to some position as *D″*. However, if the controls be moved to nose up at *D′*, it would be carried to *E* at a height *Z* above the starting point.

If now we shorten the horizontal distance of the glide until it becomes infinitesimally small, and at the same time place the center of gravity of the machine far enough in advance of the center of pressure so that the forward component of the force vector along the path of flight just equals the drift (and assuming the wind to be blowing hard enough), the machine will be lifted vertically, but will not advance. In other words, it will merely drift upward in exactly the same way as a kite is lifted. Thus it will be seen that by shortening the horizontal distance of the glide, and at the same time placing the center of gravity in the correct position relative to the center of pressure, a soaring machine can be made to climb and at the same time advance into the wind. It is possible to calculate with considerable accuracy the rate of advance thus attained.

It is especially noticeable that a position of static stability is to be avoided and that in order to soar successfully a machine must not have inherent static stability.

Thus far no attempt has been made to explain the process of soaring with the wind. In general, however, it may be said that long continued soaring flight with the wind at one's back is very difficult but not impossible.

Night Air Mail Planned

Second Assistant Postmaster General Paul Henderson expects to have, within the next fiscal year, night aerial mail service in operation on the trans-continental air mail route, either between New York and Chicago, or between Chicago and Cheyenne. The Chicago-New York run is regarded as the strategical run to advance the mail from coast to coast, but by reason of geographical difficulties, it may be decided to make the night run from Chicago to Cheyenne. The great advantage to large business interests in expediting the trans-continental mail can readily be seen.

For some time, Joseph B. Magee, a special agent of the Air Mail Service, has been engaged in making a survey of the route and the proposed equipment, and is now preparing an exhaustive report on his findings. The main thing insisted upon by the Second Assistant is that night flying shall be made approximately as safe as day flying. The plan for the night mail contemplates the establishment of brilliantly lighted landing fields at the air terminals, situated about 200 miles apart. There are to be powerful beacons every twenty-five miles, so that the pilot may pick up one after the other on his route. At each beacon, there is to be an emergency landing field, not to be equipped as are the terminals, but to be used should a forced landing become necessary.

A big electric company is engaged in planning the illumination of the air terminals, with the idea of making the landing fields as light as day. This is a big problem in itself, as it is necessary to eliminate shadows, giving the pilot a daylight perspective of the landing field. Plans must be worked out for the equipment of the planes with powerful lights to be used in making landings. An exhaustive study is being made of the different types of lights, that the one most suited to this work may be adopted.

BRITANNIA (*in holiday mood*). "'WHAT ARE THE WILD WAVES SAYING?'"
MR. PUNCH. "WELL, IF YOU ASK ME, MA'AM, THEY'RE SAYING THAT, IF YOU WANT TO GO ON RULING 'EM, YOU'VE GOT TO RULE THE AIR TOO."

A significant cartoon which appeared in a recent issue of "Punch," the English humorous weekly

The institution of the night mail is predicted upon the expectation that the cost of the extra equipment will come within the appropriation for the Air Mail Service. IF it does, there is no question but that the service will be inaugurated within the coming year.

Lisbon-Rio Flight Completed

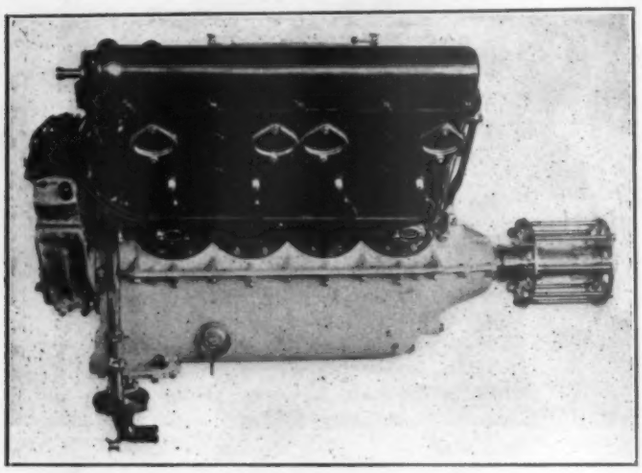
After having come to grief twice, through alighting in a very rough sea, the Portuguese naval aviators Comdr. Sacadura Cabral and Capt. Gago Coutinho have at last succeeded in reaching the South American mainland, on the third Fairey seaplane (Rolls-Royce "Eagle" engine) sent out to them. Leaving Fernando Noronha in the morning of June 5, just before 8.05 a. m., they arrived at Pernambuco, Brazil, at noon on the same day, and made a safe landing. The aviators were given a rousing reception by the population and elaborate festivities were arranged in their honor by the municipality of Pernambuco.

On June 17 the fliers reached Rio de Janeiro, their goal.

New Wright Engines for Naval Aviation

Wright Model E2 Passes 250 hr. Test -- New Model T2 525 hp. Heavy Duty Engine Passes Navy's 50-hr. Test

The Navy Department has in a quiet way done a considerable amount of development work on aircraft engines during the past two years. An interesting evidence of this is the recent completion of test of 250 hr. on a Wright E2 engine. This engine was run for two periods of 125 hr. each. One-hundred and twenty-five hour runs were continuous, 24 hr. a day, the only stops being three in each period due to gasoline shut off, trouble with oil radiator leakage, spark plug renewal and the necessity for club renewal, as part of the test was conducted in a rainy period.



Wright Model E2 180 hp. engine which recently made a 250 hr. test run for the Navy Department

Tremendous Durability

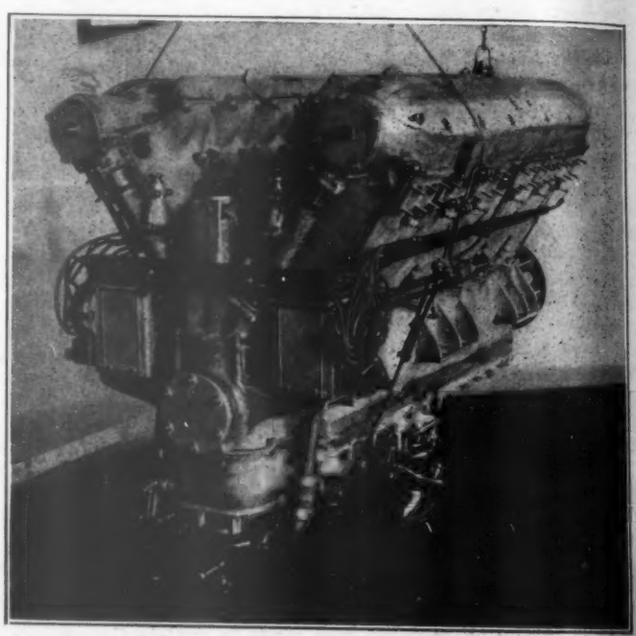
This engine was run at a rated horse power of 180, and a rated speed of 1800 r.p.m. on straight aviation gasoline. While the results of the test are not for publication as yet, it is understood that the Navy Department is well pleased with the tremendous durability shown by the engine and it is also understood that the Wright company intends to incorporate in future production engines several modifications of the standard E2 which were tried out during this test.

Representatives of the Wright Corp. who observed the test are enthusiastic about the way the men of the Bureau of Aeronautics on duty at the Naval Air Station at Anacostia, D. C., handled the running of this very arduous bit of research work. One of the most interesting points in connection with this endurance test is that the connecting rod bearings, which were the weakest point in the original type A, 125 hp. Hispano engines, from which the present engine was developed, ran for the full 250 hr. and showed no measurable wear in that period; also that the valves which were regarded as being very delicate in the early engines were in such a condition at the end of the test that they would have undoubtedly run another full period of 125 hr.

The Wright Model T2

Another result of the encouragement by the Naval Bureau of Aeronautics of independent development of aircraft engines is the development by the Wright Aeronautical Corp., of a new 12 cylinder engine, known as Model T2. This engine was designed to meet the Navy Department requirements, and has been built on Navy Department orders. It is designed for heavy-duty naval seaplanes, whose long flights require great durability, and on account of the weight of gasoline necessary, the engine had to be economical as possible. Notwithstanding these primary considerations, this engine, as developed, seems to have a wide range of application, owing to its low weight per horsepower.

Some of the T2's mechanical features are believed to be entirely new. These include a form of crankcase, in which the crankshaft is held in the upper case by bearing caps, rather than by the upper and lower halves together; a form of cam box, which not only carries the camshafts and rocker arms, but also forms a truss at the top of the cylinders. Integral with each cam box is an intake manifold, so designed that the carburetors may be placed either below the crankcase or in the Vee. An open end cylinder sleeve construction and the use of aluminum bronze valve seats are also new features. The cylinders are cast of aluminum in four blocks of three, and a single cam box covers the six cylinders of each bank, as may be seen in the accompanying illustration. In order to give the reader an idea of the size of this engine, it should be noted that it is slightly shorter than the Liberty,



Wright Model T2 500 hp. engine built for heavy duty naval seaplanes to the order of the Navy Department

and fits into the same bed timbers. The details of the engine itself are as follows:

Bore	5¾ in.
Stroke	6½ in.
Piston displacement	1947 cu. in.
Rated hp.	525 at 1800 r.p.m.

The engine is purposely somewhat throttled, in order to increase its ability to run for long periods, without decrease of power, and with a very low fuel consumption.

One of the interesting details of the engine is the cylinder construction. This permits of an aluminum combustion chamber in direct contact with the cooling water. A removable wearing surface is provided for the piston by the use of an open end steel sleeve, which is shrunk into the aluminum cylinder casting. The valves and spark plug bushings are seated in aluminum bronze rings shrunk into the cylinder heads. This construction provides for adequate cooling for both these important parts, and is considerably different from that used in the standard Wright engines heretofore, in which closed end steel cylider sleeves were used. Four valves are used per cylinder. The valves are inclined at a small angle,

and are actuated by rocker arms directly from a single camshaft housed in each cam box mentioned above. These rocker arms are carried on light steel tubes running parallel with the camshafts, which can be withdrawn from the end of the cam box, thus permitting the removal of the rocker arms. The lubrication of all of the valve operating mechanism is effected by oil carried under pressure in the rocker arm tubes. Overflow pipes are provided to return the oil to the crankcase.

Valve adjustment is taken care of by adjustment screws on the rocker arms, and in order to facilitate this adjustment, the cam box has a light two part top, which can be easily removed, enabling a mechanic to adjust all valves and inspect the rocker arms, camshafts, bearings, etc. The design of the pistons present no radical features. Three compression rings above the pin and a scraper ring on the skirt are used. The floating type of piston pin, with bronze retaining plugs, is provided. The inner and outer connecting rods have a tubular cross section, the outer rod being forked to hold a new type of connecting rod bearing. This bearing is a split sleeve and is made of a new material, which does not require a babbitt facing. The inner connecting rod bears directly on the outside of this bearing, and the bearing itself bears on the crankpin. The crankshaft is exceptionally robust, having 3 in. diameter main and crank pin bearings. Seven main bearings are used, the center and front bearings being very long. The propeller thrust is taken by a deep row radial bearings. The propeller end of the shaft is interesting, as it embodies a new design of hub fastening. The shaft itself is splined with seventeen splines. The drive is through the splines from the crankshaft to the propeller hub. The hub is centralized by a pair of tapered cones, one at each end of the splines.

An Interesting Crankcase

Details of the crankcase are most interesting, as the design, which was first used in the Wright airship engine, provides an exceedingly neat and stiff girder for carrying the engine stresses. The method of construction might almost be called a one piece crankcase, as the lower portion is only a bottom pan containing the sump and carrying the oil and water pumps. The main bearings are, as before stated, held in place by bearing caps. This method of construction makes it perfectly possible to remove the under pan, which contains no mechanism for which any readjustment is required, and thus inspect the main and the connecting rod bearings without removing the engine from the airplane.

The drives for the magnetos, camshafts, oil and water pumps, as well as the synchronizers, have been laid out with a special reference to accessibility and ease of adjustment. Not only are these drives arranged in a flat compact form, but provision is made for a generator or fuel pump drive in the Vee, and a hand or electric starter, or other auxiliary, at the rear of the engine. Water is carried to the lower side of each bank of cylinders, through suitable piping from the pump and is taken out of the propeller end of each cylinder bank. The oil passes from the pressure pump through a large cylindrical strainer, and is fed to all parts of the engine under a pressure of 75 lb. per sq. in., the only parts lubricated by splash being the pistons and wrist pins.

The ignition is by two SS12 Splitdorf magnetos, one magneto firing all the inside plugs, and one the outside. Two separate carburetors, of the latest Stromberg aviation type, are used. This engine, in accordance with the Navy Department's requirements, was built to run on standard domestic aviation gasoline. Furthermore, all parts, including spark plugs, crankcase bolts and oil strainer, are so placed as to be readily accessible and easily disassembled in the airplane.

The model T2 engine has recently been accepted by the Navy Department, after an official 50 hr. test, in which the engine developed an average of 500 hp. at 1800 r.p.m. During this test, the average fuel consumption was .48 lb., and the average oil consumption .02 lb. per b. hp. hr.

Foolish Stunts

Between 3.30 and 4.00 p. m., July 18, while the burning warehouse of the Manufacturers' Transit Co., Inc., 245 to 251 West 12th St., New York, was still giving forth an enormous column of black smoke and tons of water were being poured into the building by the N. Y. Fire Department, an HS flying boat circled back and forth directly over the burning building, at about 1000 ft. above the roof tops. The grey ship, sharply silhouetted against the smoke and clouds of an approaching thunder storm, attracted the attention of the hundreds of spectators standing outside the fire lines.

The warehouse over which the flying boat maneuvered, possibly in an attempt to take some striking air views of the fire, is located just west of 7th Ave. on 12th Street, and about one mile from the nearest water, the Hudson River. The pilot's head could occasionally be plainly seen outside the cockpit as the ship turned. Whether there were passengers aboard or not could not be seen.

A New York City Ordinance wisely provides that aircraft flying over the city should maintain a minimum altitude of 2000 ft. Apparently there exists no agency for enforcing this rule, else we would not witness such a bold disregard for it.

Vincent Astor's Air Yacht about to be wheeled out of the Loening factory, 31st St. & First Ave., New York—a feat made possible by special Ogden doors which, when raised, form a clear opening 46 ft. wide and 18 ft. high

The African Cruise of Zeppelin L59

German Naval Airship Made 4250 Mile Voyage to Succor Beleaguered German Force in East Africa

After the Armistice, when the veil of secrecy was gradually lifted from many events which could not be told while hostilities were proceeding, it was learned that a German naval Zeppelin had during the war made a four-day voyage in an attempt to succor the beleaguered German troops in East Africa, thus covering a distance of over 4200 miles without a stop. A private account of the flight was then published in AVIATION, *and at was pointed out that the African cruise of the L59 was by far the most notable voyage ever made by an airship, particularly when the load carried is taken into consideration, and also bearing in mind that no weather reports of and kind could be had of the route in question. For this reason the following account abstracted from the report of the Commander of the L59, will be read with interest.* EDITOR.

In the spring of 1917 the German colonial troops in East Africa were almost ready to surrender to the Allies for lack of ammunition and hospital supplies. Accordingly, at the suggestion of the chief of the medical section of the German staff, the German war department decided to forward the needed supplies by airship. As this involved a journey of unprecedented length and with a great military load, a number of experiments to prove the feasibility of carrying out such a plan were ordered. The German army airship LZ120 had succeeded in maintaining the air for 101 hr. just a few weeks previously, so no insuperable difficulties were anticipated.

Type of Airship Used

A preliminary investigation showed that an airship of the same type, but lengthened by 100 ft. and having a capacity of 2,365,000 cu. ft. would be required to carry the contemplated load of 14 tons over the 4460 miles of distance to be covered. Assuming a cruising speed of 40 m.p.h., the trip was expected to be made in 110 hr. After the usual laboratory tests, orders were given for the construction of the ship, and the work was begun without delay. This ship, called the L57 was ready for its initial flight just four weeks afterward (Oct. 7, 1917). A sudden storm however, destroyed the ship while attempting a landing at Jüterborg.

In the remarkably short time of fourteen days the second ship was completed and christened the L59. Without further delay it was sent successfully to Jamboli, Bulgaria, the airbase of the German troops then operating in Roumania. After some further test flights the ship was loaded and "took off" for East Africa at 8.34 p. m. on Nov. 21, 1917.

While the L59 was in the vicinity of Khartoum, on the Upper Nile, at Lat. 16° 30′ N., Long. 30° 0′ E. wireless information was received to the effect that the German troops had surrendered to the British * and the ship was recalled to its base, where it landed at 7.35 a. m. on Nov. 25. The ship had been in the air uninterruptedly for 95 hr. and had covered a distance of 4250 miles at an average speed of about 44 m.p.h.

Some Meteorological Data

Advantage was taken of this trip to collect some valuable meteorological data. It was found that a fairly constant monsoon blowing from North East at low altitude, and from the South in the upper regions, gave considerable assistance in either direction. As might be expected, strong vertical currents and bumpiness made themselves felt over the desert regions, especially toward noon, causing violent cases of seasickness even among the most experienced members of the crew. A number of thunderstorms over the Mediterranean were narrowly avoided. At the start the temperature was 32 deg. F., which increased with southward travel to 77 deg. F. Over Asia Minor as low as 10 deg. was recorded. The average temperature in the cabin was 84 deg. F. which contributed considerably to the physiological effects of the trip on the crew. Upon landing they showed signs of having undergone unusual hardship and nervous strain, but the latter is in part attributable to disappointment of the fruitless outcome of the trip. The majority of the men also suffered from violent colds after landing, resulting from the sudden variations in climate and temperature.

The trip demonstrated that for night flying in tropical countries as much as 6600 lb. ballast must be figured on per night. The amount of ballast taken aboard proved insufficient in this case and in consequence some of the cargo had to be jettisoned, valuable as it was. It was proven however, that under normal circumstances a load of 10 tons can safely be carried by a ship of that type in colonial transportation. The engines functioned without trouble of any kind. A break in one of the transmission housings could fortunately be welded on the spot, causing no further damage than a 15 per cent reduction in power on that one power unit.

What the Cruise Proved

From a technical viewpoint the trip was highly successful, and the results obtained show that had not political events intervened, the goal would have been reached in four day's flying without trouble. It was proven that airship transportation under the given conditions is eminently satisfactory and that large cargoes can be carried without difficulty for distances requiring several consecutive days' navigation.

The military load carried on this voyage by the L59 was apportioned as follows:

Hospital supplies	6,548 lb.
Ammunition	16,354 "
Ordnance	7,191 "
Sewing outfits	440 "
Mail	116 "
Astronomical instruments	112 "
Books	116 "
	30,877 lb.

* This is now known to have been a false report circulated by the British, picked up at Berlin and relayed from there to the L59. EDITOR.

Automotive Export Campaign

A united campaign to sell American automotive transportation to the world was begun June 12 on the departure from New York of Gordon Lee, Chief of the Automotive Division, Bureau of Foreign and Domestic Commerce, Department of Commerce, who during the next two months will make a nation-wide tour, visiting a score or more cities.

Mr. Lee and Maj. Horace M. Hickam, representing the Army Air Service, who flew to New York from Washington, addressed a conference of automotive manufacturers at the Transportation Club. The conference was attended by representatives of the National Automobile Chamber of Commerce, Motor and Accessory Manufacturers' Association, Aeronautical Chamber of Commerce, Automotive Equipment Association, Motorcycle and Allied Trades Association, National Association of Engine and Boat Manufacturers, Association of Automotive Equipment Manufacturers, the Class Journal Co., and the Black & Decker Mfg. Co.

The campaign embraces the development of the foreign market for American constructed automobiles, motor trucks, aircraft, motorcycles, and motor boats. Mr. Lee expects to fly between many cities on his trip.

Air Service Develops Airway Program

Establishment of New Transcontinental Airways Planned for Service Flying and Civil Aviation

The latest project of the Airways Section, Office, Chief of Air Service, is the formulation of a plan for the thorough investigation of practically 90 per cent. of the proposed airway system of the United States. Letters of instructions have already been sent out to the various Army Air Service flying fields, designating certain routes over which pilots from those fields should fly. Upon the completion of the initial investigation of the routes tentatively selected, and after a decision is reached as to the most advisable routes to fly over, the Air Service contemplates making arrangements for the inauguration of a regular bi-weekly airplane patrol over these routes, to enable pilots of the various fields to ascertain from time to time the condition of landing field facilities in the district allotted to them.

Pilots will be required promptly to report any field previously selected which has since been plowed up or otherwise rendered unsuitable for landing.

The object of establishing a system of air routes across the continent is to enable the Army Air Service to plan cross country flights of a special nature, such as maneuvers, etc. The establishment of this transcontinental airway system should also prove of material aid to commercial flying and stimulate long distance flights. Flights across the United States will not be of such a rare occurrence as at present, and it is possible, in view of the great saving of time, such flights will become popular since they will curtail a journey of at least five days by train to two days at the most.

Captain Street's Long Flight

The trip recently made by Capt. St. Clair Street, A.S., on duty in the Airways Section, Office Chief of Air Service, for the purpose of making a general survey of landing field facilities in the eastern and middle west sections of the United States was productive of excellent results and, it is believed, will ultimately result in the establishment of a network of landing fields in these sections of the country which will go a long way in not only extending the field of commercial aviation but also in increasing the element of safety in flying.

In the various localities visited by Captain Street the various commercial aeronautical concerns, as well as the municipal authorities, aero clubs, chambers of commerce, etc., were made acquainted with the efforts being made by the Army Air Service to encourage the growth of commercial aviation. Captain Street states that at those places visited where commercial aviation concerns had been actively operating there prevailed a marked enthusiasm for aviation and a willingness to cooperate in any manner possible. It is his contention that it is the duty of every Army pilot to educate the public in the safe and sane usage of the airplane; with the fact that by its use one is enabled to cover long distances in a short space of time; that with the existence of adequate landing fields regular schedules of flight can be maintained without interruption, since with aviation equipment developed to its present degree of efficiency it is very seldom nowadays that it is found necessary to postpone flying on account of unfavorable weather conditions.

Aside from the primary purpose of the trip, that of boosting commercial aviation and securing all available information on landing field facilities, much useful data was obtained which will aid in the preparation of standard maps.

Itinerary of the Trip

The itinerary of the trip was as follows: Moundsville, West Va.; Columbus, Ohio; Dayton, Ohio; Indianapolis, Ind.; Louisville, Ky.; Camp Knox, Ky.; Kokomo, Ind.; Wabash, Ind.; Lafayette, Ind.; Rantoul, Ill.; Belleville, Ill.; St. Louis, Mo.; Fulton, Mo.; Kansas City, Mo.; Fort Leavenworth, Kansas; Lincoln, Neb.; Omaha, Neb.; Des Moines, Iowa; Cedar Rapids, Iowa; Iowa City, Iowa; Davenport, Iowa; Monmouth, Ill.; Chicago, Ill.; Milwaukee, Wis.; thence back to Dayton, Ohio; Toledo, Ohio; Camp Perry, Ohio; Cleveland, Ohio; Buffalo, N. Y.; Rochester, N. Y.; Syracuse, N. Y.; Utica, N. Y.; Schenectady, N. Y.; Albany, N. Y.; Boston, Mass.; Hartford, Conn.; New York City; Baltimore, Md.; Washington, D. C.

Despite the fact that for five days during the trip between Dayton and Rochester rainy weather prevailed practically the whole time the plane was in the air, the whole trip was accomplished without incident. The plane used was a DH4B, which covered approximately 4,000 miles, the entire trip consuming five weeks.

Dr. S. M. Burka, of McCook Field, accompanied Captain Street on the trip from Dayton to Omaha and return, while Lieut. George W. Goddard was the passenger on the remainder of the journey back to Washington. Photographs were taken of all possible landing places whenever the weather permitted, and sketches were made of all fields visited.

Efforts were made to enlist the interest of the various Chambers of Commerce and civic officials in the matter of the establishment of landing facilities where such facilities could be made of value. Data was obtained from commercial aviation operating companies on their past operations and on their plans for the future. A number of cities visited either have adequate landing facilities or contemplate the immediate establishment of same, viz; Louisville, Columbus, Kokomo, Wabash, St. Louis, Fulton, Kansas City, Lincoln, Omaha, Des Moines, Davenport, Monmouth, Chicago, Milwaukee, Buffalo, Rochester, Utica, Schenectady, Albany, Boston, Hartford and Baltimore. At the present time facilities are available at all of these cities where landings can be effected, and at every one of these cities the Chamber of Commerce and civic officials, as well as commercial aeronautical firms, invite army and civilian pilots to use their facilities. Detailed information with regard to the landing facilities at the above mentioned localities can be obtained from the Airways Section, Office Chief of Air Service, Washington, D. C.

Operation of the Model Airway

On the other hand, plans have been perfected for a schedule of flying along skeleton lines on the Model Airway, embracing the following terminal stations; McCook Field, Dayton, Ohio; Langin Field, Moundsville, West Va.; Langley Field, Hampton, Va.; Bolling Field, Anacostia, D. C.; and Mitchel Field, L. I., New York. This schedule has been inaugurated with the purpose in view of having regular flying over the route each day. The schedule to start with provides for a plane from one of the terminals to cross the mountains each day. Planes will be flown without mechanics, in order that personnel or packages may be transported to various destinations along the Model Airway.

During these flights a study will be made of the weather conditions prevailing along the various routes of this airway at different periods of the year. Various navigation instruments, now being developed at the Engineering Division, McCook Field, Dayton, Ohio, will be installed in the planes scheduled to make regular flights, in order that thorough tests of same may be made.

The flights arranged by this schedule shall start at 9 a. m., 12 noon, and 3 p. m., as noted below. In this way ample time is allowed for the average time of flight required between points, and for servicing the planes incident thereto. The schedule is as follows:

	HOME STATION	LEAVE 9 A. M.	LEAVE 12 NOON	LEAVE 3 P. M.	DESTINATION
Monday	McCook	McCook	Langin	Bolling	Langley Field
Tuesday	McCook	Langley	Bolling	Langin	McCook Field
Wednesday	Mitchel	Mitchel	Bolling	Langin	McCook Field
Thursday	Mitchel	McCook	Langin	Bolling	Mitchel Field
Friday	Langley	Langley	Bolling	Langin	McCook Field
Saturday	Langley	McCook	Langin	Bolling	Langley Field

Safety Record of Air Mail

At 12 p. m. July 16, the Air Mail Service of the Post Office Department completed a year's daily service without a single fatal accident. During this time the planes flying on the New York to San Francisco route covered 1,750,000 miles. More than 49,000,000 letters totaling 1,224,500 lb. were transported by air.

The record of the Air Mail Service for the past year proves more conclusively than any other test ever made, the reliability and the efficiency of the airplane in commercial service. Through every kind of weather, summer, fall, winter, and spring, and over mountains, deserts and forests, the Post Office Department air mail planes flew. The percentage of trips actually completed was 92.5 as compared with 83 per cent for the last fiscal year. The percentage of scheduled miles actually flown was even higher, totaling 94 per cent.

While routes totaling 820 miles were discontinued during the last fiscal year and only the transcontinental route of 2680 miles maintained, the Air Mail Service nevertheless carried the same amount of mail as it did last year, or 23 per cent more in each airplane load.

Officials of the Air Mail Service attribute the record of no fatal accidents in a year to the fact that all their pilots now are experienced and tried and they know the route. That the pilots of the Air Mail planes of the Post Office Department are top notch among the fliers of United States, was established at a recent Mid-Western Flying meet at Monmouth, Ill. Here the fliers of the Air Mail Service took five events of the eight and six cups of the nine given as prizes. The mechanics too, are more experienced. Last year was a pioneer year. Then the pilots were learning the routes they were flying and the field and hangar equipment was inadequate. During the fiscal year ending June 30, 1921, seventeen people died in accidents in the Air Mail Service. Many of the fatalities occurred with metal monoplanes which were abandoned. During the last fiscal year one pilot was killed, his death occurred on July 16, 1921, but no man has met death in the government Air Mail Service since then. In the last year no flier has been in the hospital more than five days.

The Air Mail Service is now maintaining sixteen stations on the ocean to ocean route. Fifty-six planes are ready to fly. In addition some are being overhauled, and some are in storage, waiting to be assembled. The Air Mail Service is employing forty of the most expert pilots in the United States. The total number of men employed to fly the planes and to keep them in repair is 372. Every day twenty-one pilots and planes are in the air flying approximately 6000 miles.

Trade Notes

The Lincoln Standard Aircraft Co. has delivered twenty-two Lincoln-Standard planes during the months of May and June. The quality of this ship, and the price seem to be attracting buyers from all corners of the United States, and there are under construction at the present time about fifty more. Deliveries of last week include one Tourabout to L. W. Lamb, of Billings, Mont.; one Tourabout to H. A. Rogers, of Bird City, Kan.; one Tourabout to the Swinson Buick Co., of Pratt, Kan.; and one five-passenger cruiser to the Hollingsworth Land Co., of Haswell, Colo. The Lincoln-Standard company will participate in the Chicago Aerial Pageant with one Air Coach, one Speedster, and three Tourabouts. They would be very glad to meet any prospective buyers.

C. H. Truitt, of Cincinnati, who was recently mentioned in this column as having "gone out of business" requests us to state that his aeronautical booking agency only temporarily suspended business during depression.

Charles S. (Casey) Jones, manager of the Department of Flying Operations, Curtiss Aeroplane & Motor Corp., reports that they have trained and passed sixty pilots in the last year. Twelve students are now taking training at Curtiss Field.

Edna Wallace Hooper and Eddie Brooks recently made a flight from Rock Springs, Wyo., across the Continental Divide, in a Curtiss "Oriole."

The Chicago Flying Meet

The Aeronautical Chamber of Commerce of America advises that it is sympathetically co-operating with the Aeronautical Bureau of Chicago in preparing for an air meet to be held at Grant Park, Chicago. This meet was originally scheduled to be held Aug. 4-13, but the date has now been temporarily postponed as it was found upon mature reflection that the time was too short to allow for the proper organization which would reflect credit upon Chicago. This meet was planned months ago, but was made possible only through the recent incorporation of the Bureau, which has the co-operation of the Army, Navy and Postal air services. W. A. Dudley, representative of the Bureau, has obtained the advice and co-operation of Caleb S. Bragg, Chairman of the Contest Committee, Aero Club of America, in revising and supervising the events.

It is understood that the Chicago meet will in no way interfere or conflict with the Pulitzer race to be held in Detroit in

Vickers "Vulcan" commercial airplane used on the London-Paris airway

October, but that, to the contrary, the Chicago Aeronautical Bureau is prepared to contribute generously to the success of the Detroit Congress by organizing its Corps Area and sending a special train to Detroit.

In addition to the flying events, details of which were published in the July 17 issue of AVIATION, efforts are being made to interest and assist accessory manufacturers allied with the aircraft industry.

The Aeronautical Chamber of Commerce is advised that several of its larger members are participating in the contests. Addresses at the conference are to be made by Glenn H. Curtiss, of the Curtiss Aeroplane & Motor Corp., Garden City, N. Y.; Grover C. Loening, president of the Loening Aeronautical Engineering Corp., New York City; Charles F. Redden, president of Aeromarine Airways, Inc., and by C. G. Peterson, assistant to the president, Wright Aeronautical Corp., Paterson, N. J.

Prospective exhibitors or participants in the Chicago meet, are requested to communicate direct, as follows:—

Entries in flying events: C. S. Rieman.
Program of Air Conference: W. A. Dudley.
Accessory Exihibit: Maj. M. L. Bromberg.

Address for all: Chicago Aeronautical Bureau, Inc., Congress Hotel, Chicago, Ill.

Airport at Walla Walla

The Commercial club at Walla Walla, Wash., obtained an indefinite lease on a tract of land one mile east of the city for use as an aviation field. The land is owned by Eugene Tausick and the Baker Langdon Co. and can be leveled at little cost. The owners agreed to let the club use the land without cost. Several automobile dealers have agreed to furnish tractors to help level the ground.

This is the first step in a movement to put Walla Walla on the aerial route. The field will be available to any aviator who happens to be traveling through and will be suitably marked so that it can be plainly seen from the air.

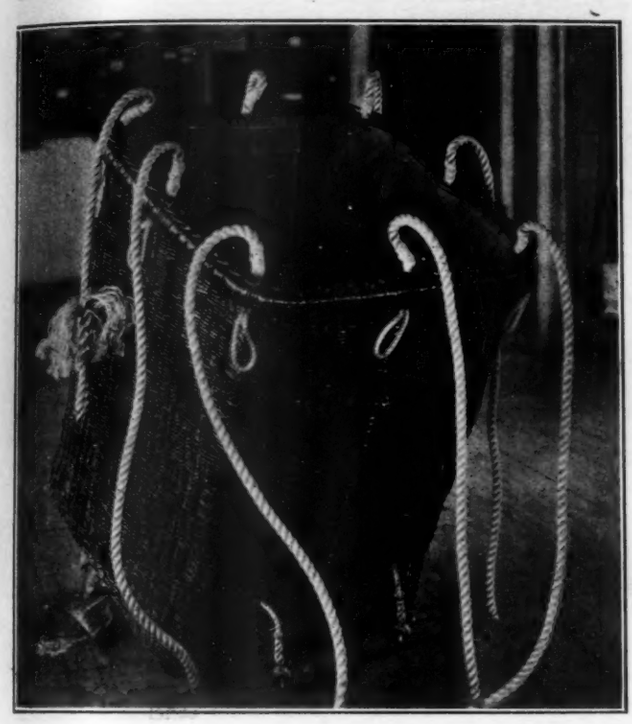
G. B. Balloon Team Sails

Members of the Army and Navy teams who will compete in the Gordon Bennett international balloon race at Geneva Aug. 6 sailed on July 12 on the American Line steamship St. Paul.

Composing the Army team were Maj. Oscar Westover, pilot; Lieut. Charlton F. Bond, aide; Lieut. William E. Connolly, operations officer and alternate pilot; and Lieut. William E. Huffman, Superintendent of Aeronautic Construction at McCook Field, Ohio.

Mrs. Westover accompanied the Major and Mrs. Connolly, a bride of two days, the Lieutenant.

The Navy team was made up of Lieut. W. F. Reed, jr., pilot; Chief Aviation Rigger James F. Shade, aide; and



Official Photo U. S. Navy

The light weight basket of the Navy balloon entered in the Gordon Bennett race

Lieut. Commander P. J. Norfleet, alternate pilot. The Navy will have two balloons, one already shipped and another to go on La Savoie of the French line.

The team is scheduled to arrive in Geneva on July 27, spending the intervening time before the race in the preparation of equipment and study of meteorological conditions. Through the courtesy of the Weather Bureau a table has been prepared showing mean conditions of temperature, air pressure and wind direction and velocity at various altitudes for this general period of the year. The main concern of the team will, therefore, be to ascertain whether the season is advanced, normal or retarded.

The balloon used by the Army team will be the same as that with which the National Race was won this year. It was also piloted to victory by Ralph Upson in 1921. The dimensions are 100 ft. from basket to top of bag, and 75 ft. in diameter. The capacity of the bag is 80,000 cu. ft. and is rated to carry 1650 lb. of weight. A distinct characteristic is a ring about 1½ ft. in width around the circumference of the bag which steadies the bag much as a "deep sea anchor," and permits remaining in favorable air currents of limited depth.

New Crash Proof Tank

The following particulars are available regarding the crash-proof gasoline tank styled the "Silvertown Anti-fire Self-Sealing Petrol Tank," which was awarded the first prize in the British Air Ministry competition for fuel tanks that will withstand machine gun fire and crashes without leakage of contents.

The metal shell or tank proper consists of thin-gage metal plate butt welded together and of such a form as to permit of a large increase of capacity before bringing any tensile stresses to bear on the metal, with the result that the seams successfully withstand the stresses set up by gun fire and in crashing. This end is achieved by dishing inward each side of the complete tank.

The patent detachable cover is made of a high-grade rubber about a quarter of an inch thick, formed with an opening large enough to permit of the introduction of the shell. This opening is then closed with a closure piece of the same material suitably fastened in place, and it is claimed that this detachability renders the cover superior to any previous device. The cover can be manufactured and stored apart from the metal shell, and the latter can be removed from its cover and replaced at any time, without in any way causing damage to either.

The judges appointed by the Air Council consider that the competition has resulted in the achievement of the objects for which it was instituted, and has produced a type of safety fuel tank which, although capable of improvement in several minor respects, is available for immediate introduction on service and civil aircraft, and which, for a slight increase of weight over and above that of the standard service steel tank, gives almost complete immunity from fire, either in a crash or in action with enemy machines.

The Detroit Aviation Meet

The Detroit Aviation Meet, organized by the Detroit Aviation Society of 4612 Woodward Ave., Detroit, Mich., was primarily scheduled for the purpose of holding the third annual contest for the Pulitzer Trophy. However, in order to arouse the widest possible interest in flying and stimulate the development of commercial aviation in both land and sea going branches, the plans have been elaborated to include diversified types of planes. The intention of the organizers is to attract a large list of land and sea entries, and to have them compete for prizes to be awarded on the basis of the best combination of high performance and improved construction without, however, having recourse to too complicated rules incapable of being satisfactorily applied.

The Detroit Aviation Meet will be held from Oct. 7 to 14 inclusive, comprising the following events:

Event No. 1. Detroit Aerial Water Derby, including competition for the Curtiss Marine Flying Trophy, on Saturday, Oct. 7, with a total of $2,000 of cash prizes;

Event No. 2. Detroit News Aerial Mail Trophy, a race for large capacity multi-engined airplanes, with a total of $2,000 of cash prizes, Thursday, Oct. 12;

Event No. 3. Aviation Country Club of Detroit Trophy, a race for light commercial airplanes, with a total of $2,000 cash prizes, Thursday, Oct. 12;

Event No. 4. Liberty Engine Builders Trophy, a race for observation type two-seater airplanes, with $2,000 of cash prizes, Friday, Oct. 13;

Event No. 5. Pulitzer Trophy Race, a free-for-all race for high speed airplanes, with $2,000 of cash prizes, Saturday, Oct. 14.

In each event the cash prizes are apportioned as follows: First Prize $1,200; Second Prize $600; Third Prize $200.

The entry fee, $100.00 will be refunded if the contestant is in his allotted place ready to start in the contest, provided the entry is received before Aug. 1, 1922. Entries received after this date, but prior to Aug. 8, will be penalized $25.00, and entries received after the latter date, but prior to Aug. 15, will be penalized $50.00. After Aug. 15 entries will only be accepted with the written consent of all other entrants, and the entry fee will not be refunded.

The Contest Committee of the Detroit Aviation Society has been authorized by the Aero Club of America to issue temporary aviators' licenses for these events.

Goodyear Gets Large Contract

The Goodyear Tire & Rubber Co. announces that it will shortly undertake the construction of the first semi-rigid airship ever built in this country. The order for the ship was received from the Army Air Service, which ordered besides five non-rigid airships, the largest single order for lighter-than-air-craft placed in the country by the Army since the war. All of the airships will be equipped and designed for use with the helium gas.

The big semi-rigid ship, which is to be 300 ft. long with a gas capacity of 750,000 cu. ft., will also be the first built to be used as an airplane carrier. The ship, which was designed by Goodyear engineers in conjunction with army engineers at McCook Field, will have a cruising radius of over 4000 miles at a speed of 44½ m.p.h., and at 70 m.p.h. will have a flying range of 1630 miles. Two power cars and a navigators' car will be attached to the metal keel of the ship. The envelope will be practically a single bag, divided by a diaphragm lengthwise through the middle. In cross-section it will resemble the general outlines of a heart, placed upside down over the metal keel. The keel terminates in a cone-shaped structure at each end to hold the big bag in shape.

The five smaller non-rigid ships also ordered by the Army, three will have bags of 250,000 cu. ft. capacity, somewhat larger than the standard 180,000 cu. ft. hydrogen ships, to compensate for the difference in lifting power between hydrogen and helium. The two smaller ships of 130,000 cu. ft. capacity will be comparable with the 90,000 cu. ft. hydrogen training ships.

The five airships will be assembled at Wingfoot Lake air station, as will three Navy airships now nearing completion.

The big ship will take about fifteen months to build, and is to be completed by October, 1923. It will be stationed at Scott Field, near Belleville, Ill., after delivery to the Army.

American Aviation Forging Ahead

The official report of the Navy Department relative to America taking the lead in the development of torpedo planes was hailed by aeronautical experts as a further proof of the rapid advance toward complete superiority in aviation being made in this country.

"Due to the necessities of governmental secrecy it is to be regretted that the public cannot be more fully informed of the rapid and successful progress being made by the Navy Department and the Army Air Service in their technical developments," said Grover C. Loening, President of the Aeronautical Chamber of Commerce.

"Statistics compiled by the Aeronautical Chamber of Commerce show more and more every day the lead that America is assuming in all branches of aviation. Added to the Navy's achievements in the successful development of torpedo planes may be mentioned the successful development by the Navy Department of the catapult and of various types of planes for shipboard use that have proven most satisfactory. The Army Air Service has perfected many new types of combat and bombing planes and the Army has actually perfected, ready for service, armament for combat planes, details of which cannot be disclosed, which is far superior to anything in Europe. In addition to this, the Army Air Service, in order to stimulate the development of the highest class of pursuit planes, has placed *carte blanche* orders with several constructors for the fastest airplanes in the world, which are now being built around high powered motors that were initiated and perfected by the engineers at McCook Field.

"Practically every world's record of any consequence is held in this country. The world's altitude record, the world's speed record around a circuit; the world's seaplane records; the world's endurance record, were all made by American pilots within the last year.

"America has the fliers, the raw materials, the engineers and splendid government technical departments, that have all combined toward the aim of making this country supreme in aviation and the results achieved in a short year have surprised even the most optimistic.

"The Air Mail Service is the greatest commercial air route operated anywhere, with a record not even approached by any European air line, of having flown 3,525,020 miles up to Jan. 1 of this year.

"Air yachting by private owners of aircraft has been started in this country with excellent results. This is a branch of commercial aviation that is totally unknown in Europe. The chartering of seaplanes and flying boats of several different types, for trips from New York and other large centers, to neighboring watering places, is practically a daily occurrence and while there are in this country as yet no overland air routes, such as London to Paris, the success that the flying boat operation in this country has achieved when compared to the difficulties and tremendous expense of the London to Paris route have led many experts to the conclusion that the conception of commercial aviation in this country is far sounder and more practical. It appears to be a curious fact that a large number of the passengers on the European air lines are Americans.

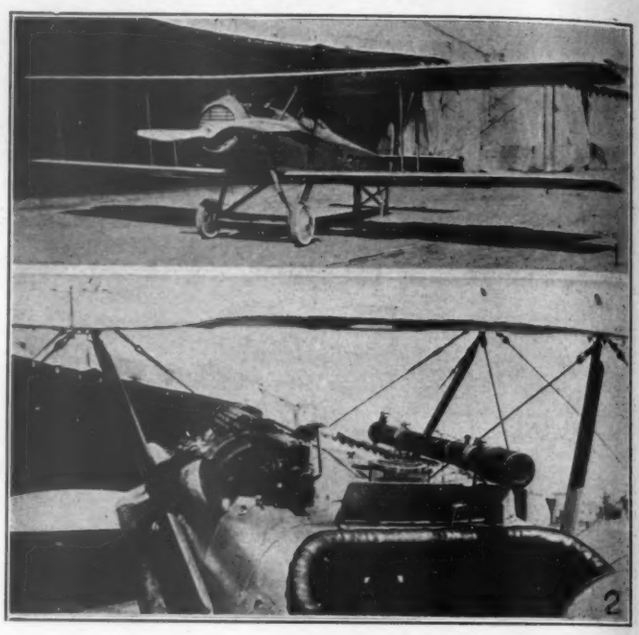


Fig. 1. Vought combat plane of the U. S. Navy.—Fig. 2. Looking forward from the cockpit of the Vought combat plane

"Much of the rapidly increasing success of American aviation is attributable to intelligent interest and co-operation of the Army and Navy. This country lacks two things—aeronautical legislation as presented in the Wadsworth Bill now before Congress and public support and confidence in air travel which is being greatly stimulated by the recent successful developments in all branches of American aviation."

Warning to Aviators

The following information has been received from R. R. Blythe, of Johnson and Higgins, Average Adjusters and Insurance Brokers, New York. Mr. Blythe is the organizer of the successful Aeronautic Executives' Luncheons.

"At High Hill Beach, New York via Belmore, L. I., near the U. S. Coast Guard Station No. 87, there is a large platform, painted green, and displaying the numerals 87 in large size, painted white. The platform is surrounded with grass about 2 ft. high, which forms an apparently level surface about one-half mile wide and two miles long. From the air this would appear to be an ideal landing field, the more so as the number 87 may be mistaken for an identification marker; in reality this surface is on exceedingly marshy ground, and should a pilot attempt to land there he would undoubtedly damage his machine."

AVIATION would welcome it if more of its readers would contribute information of this kind.

ARMY AND NAVY AIR NEWS

Air Service

Long Cross-Country Flight Planned—General Patrick has authorized Lieut. James H. Doolittle, A. S. to make a non-stop cross-country flight from Jacksonville, Fla. to Rockwell Field, San Diego, Calif. a distance of approximately 1600 miles.

The plan is for the pilot to leave Jacksonville about August 1 in a remodeled DH4 carrying about 13 hr. of gasoline and oil. Lieutenant Doolittle is now in Dayton, Ohio, conferring with the Air Service Engineers at McCook Field with a view of securing their approval of certain modifications on his ship before he starts on his transcontinental flight. Before embarking he will make a non-stop test flight from Florida to New Orleans and return.

Lieutenant Doolittle is one of the best known and versatile Army pilots and holds several distance flight records, among them a trip of 1907 miles from Kelly Field, Tex. to Rockwell Field, Calif., which he made in 12½ hr. flying time, or at a speed of about 152 m.p.h. Enroute to Dayton Lieutenant Doolittle made a circuit flight from Kelly Field, Tex., to Pensacola, and Jacksonville, Fla., Langley Field, Va. and Bolling Field, D. C.

* * *

Long Distance Flight for Airship A4—Orders have been issued to fly the airship A4 of the Army Air Service from Langley Field, Va., to Scott Field, Ill., the new home of the Airship School. The flight will be a distance of approximately 1100 miles. Lieut. A. O. Anderson, A. S., will pilot the ship and make stops at Bolling Field, D. C.; Moundsville, W. V.; Akron and Fairfield, Ohio. Photographs and sketches will be taken of possible landing points along the air-route between these stations. The data secured on them will be made available for commercial aeronautics.

The A4 was used principally for training purposes by the students of the Airship School at Langley Field and will serve the same purpose at Scott Field. It is 162 ft. long, 39 ft. wide, 47 ft. high and its capacity is 95,000 cu. ft. It is equipped with a Curtiss OX5 motor.

* * *

More Balloon Companies on Inactive List—Orders issued by the Adjutant General leave only those enlisted men at March Field, Mather Field and Rockwell Field who have less than four months to serve on their current enlistments. Those enlisted men with less than one year to serve will not be sent to Panama.

Balloon Cos. 1 and 13 at Ross Field and the 18th Squadron (Observation), stationed at Rockwell Field, San Diego, Calif., are placed on the inactive list. The personnel is to be distributed between Scott Field, Ill.; Panama and Langley Field, Va.

* * *

Tennessee National Guard—The past two weeks have been unusually busy ones for the 136th Aero Squadron Tennessee National Guard, despite many showers. The three JN6H's have been used considerably. Four pilots have been flying quite frequently, and their work after the three years' lay off is very commendable.

* * *

Flying Fields as Permanent Military Posts—Bolling Field, Anacostia, D. C., and Scott Field, Belleville, Ill., have been announced as permanent military posts.

Army Airmen Aid Flood Victims—Army pilots from Kelly Field did great work in aiding flood victims along the Rio Grande Valley, according to an official report received by the Chief of the Air Service covering the operations of the 3rd Group (Attack), Kelly Field, Tex., on this duty. In the daily patrol of the airplanes, stranded flood refugees were pointed out and boats were detailed to rescue them. Mail and official correspondence were carried between Fort Ringgold, Camp McAllen, and Fort Brown. Officers and soldiers with urgent military duty to perform at any of these three army posts were furnished with the only possible means of transportation then existing—the airplane. The condition of canals, levees, roads, farm lands, houses and cattle were daily reported upon to the civilian authorities. Warnings to the people were given by means of drop messages. A total flying time of more than 50 hr. was spent in aerial reconnaissance over the region of Texas comprising Rio Grande City, Hidalgo, Brownsville, San Benito, Harlingen, Sabastian, Lyford, Raymondville, Mercedes, San Juan and McAllen.

In less than three hours after an urgent request for assistance on the part of the Army Air Service was received from the civil authorities of the stricken towns, three airplanes from Kelly Field were enroute to the scene of the flood. One of the pilots, Lieutenant Selzer, succeeded in reaching McAllen, Texas, the readquarters of operations, before sundown, after circling a heavy rain storm. Lieutenants Biggs and McCormick, the other two pilots, were cut off by the storm, made a forced landing at Laredo, Tex., but reached headquarters early next morning, when a plan of operations, after conference with the civil authorities of the flooded towns was drawn up.

Representatives of the towns in the flooded area, in joint session, passed a resolution of appreciation to the Army Air Service for it's promptness and efficiency in rendering assistance in this emergency.

* * *

Moro Warriors Dread the Airplane—Air Service pilots on duty with the 3rd Aero Squadron, which recently served a tour of temporary duty at Jolo, Sulu Archipelago, Philippine Islands, have been bringing back interesting tales of how the natives act and what they think of the aerial activities in that province. Some Moros believe the airplane an emissary from Allah; others that the superhuman occupants are all-seeing and all-powerful, and still others that the plane is a dragon flown out of the South Seas come to wreak dire vengeance on all bad Moros, according to an old Arabic Legend. It is reported that there are thousands of Moros in the wilds of Mindanao who have never seen a white man.

Capt. John I. Moore, A. S., reports that while on a reconnaissance flight near Meimbun, in South Jolo, he was at a loss to account for a native who was riding along the highway, holding aloft in outstretched arms a small white sheet, as if in supplication. Upon mentioning the fact later to Major Stephens, Commandant of the local Constabulary, that officer, having heard of similar incidents, stated that certain natives are authorized to carry barongs or knives by written permit. Those who are apprehended with knives, but without permits, are severely punished. The native in question, who was carrying a barong, was holding his permit aloft for Captain Moore to read from his plane, in fear that one of the fearsome bombs he had heard so much of might be dropped on him otherwise, or that the plane might swoop down upon him and confiscate his weapon.

Army Orders—First Lieuts. Orvil A. Anderson and Harvey H. Holland, A. S. relieved from duty at Scott Field, Ill. are assigned to Brooks Field, Tex. for duty and pilot training.

Orders directing Maj. Frank M. Andrews, A. S. to change station are revoked, and he will remain on his present duties with the School of the Line, Ft. Leavenworth, Kan.

Maj. Benjamin G. Weir, A. S., relieved from duty at Little Rock Air Intermediate Depot, Ark., is assigned to the Philippine Department for duty with Air Service troops.

Capt. Charles A. Pfeffer, M. C., has been assigned to Mitchel Field, L. I., N. Y., Medical Research Laboratory, and School for Flight Surgeons, for duty.

Lieut. Grissom E. Haynes, A. S. having been found incapacitated for active service by an Army retiring board, his retirement from active service is announced.

Previous order relating to Capt. Richard H. Ballard, A. S. is modified as follows: Captain Ballard, now at Kelly Field, Tex. is relieved from further duty at Carlstrom Field, Fla. and is assigned to permanent station at Langley Field, Va.

Capt. Hubert V. Hopkins, A. S. relieved from duty at Ross Field, Calif. is assigned to Scott Field, Ill.

First Lieut. William V. Andrews, A. S. is detailed as a member of the War Department Board of Contracts and Adjustments vice Maj. George E. A. Reinburg, A. S.

Previous order relating to First Lieut. Joseph P. Bailey, A. S., is amended so as to direct him to proceed from Ross Field, Calif. to Scott Field, Ill. for duty as member of the A. S. Balloon Observers' School.

Previous order assigning Maj. Lewis H. Brereton, A. S. to Post Field, Okla. for duty, is amended so as to direct him to proceed to Kelly Field, Tex. for duty.

The transfer of First Lieut. Thomas H. Chapman, Q. C., to the Air Service is announced.

Maj. Frank M. Kennedy, A. S., relieved from duty at Scott Field, Ill., is assigned to Berlin and Friedrichshafen, Germany, on temporary duty to carry out the confidential instructions of the Secretary of War.

Capt. Floyd E. Galloway, A. S., relieved from duty at Post Field, Okla., is assigned to duty with the Organized Reserves of the Third Corps Area, Baltimore, Md.

First Lieut. James T. Cumberpatch, A. S., relieved from duty at Kelly Field, Tex., is assigned to Brooks Field Tex. for duty.

* * *

Sales of Air Service Supplies—The Director of Sales, War Department announces that the following sales of Air Service supplies, subject to change, have been scheduled to be held during August:

Aug. 24—Park Field, Tenn. Auction.

Aug. 29—Americus, Ga. Auction.

Naval Aviation

Naval Aircraft at Chicago Congress—Participation by squadrons of Navy seaplanes and Marine Corps land planes in the forthcoming Aeronautical Congress to be held in Chicago is announced in the Bureau of Aeronautics.

Twelve naval planes in all will be ordered to the Congress and will fly from the respective Air Stations where they are now operating. One observation squadron of six shipplanes will be sent from Brown Field, Quantico, Va., and a squadron of three torpedo planes will also be dispatched from Quantico. A squadron of three F5L seaplanes will fly from Pensacola, Fla., to Chicago via the Mississippi River. This will be the first flight of Navy seaplanes up the Mississippi River since the notable flight of the NC4 which made the trip under the command of Commander A. C. Read, U.S.N., upon the return of the NC4 from the successful trans-Atlantic flight in 1919.

Rear-Admiral W. A. Moffett, Chief of the Bureau of Aeronautics, will fly to Chicago from Washington and will address the Congress. An officer detailed by the Bureau of Aeronautics will go to Chicago shortly to make arrangements with the Aeronautical Bureau there for the arrival of the naval planes and for an exhibit of the activities of the Aviation Mechanics' Schools.

Building the ZR3—The office of Inspector of Naval Aircraft has just been established at the works of the Zeppelin Airship Co., Friedrichshafen, Germany, in connection with the work of constructing the giant rigid airship ZR3 which will be delivered to the United States by the German government on reparations account.

The office of Inspector of Naval Aircraft at the Zeppelin Works is in charge of Lt. Comdr. G. Fulton, U.S.N. (C.C.), who has been detailed by the Secretary of the Navy to this duty. Lieut. Commander Fulton has with him a corps of assistants which he took to Germany from this country to aid in the work of inspecting the ZR3 in the course of construction.

The ZR3 when completed will be the largest airship in the world and will be flown to this country across the Atlantic by

Photo International

The mooring tower for airships at the Lakehurst naval air station, where the ZR3 is to be housed

a German crew and delivered at the Naval Air Station, Lakehurst, N. J. It will have a capacity of 70,000 cu. m. and will carry thirty passengers and a crew of twenty men. The airship will be constructed according to specifications approved by this country and the personnel of the inspectors office will be in close touch with the work as it progresses insuring that all parts which go to make up the ship are according to the plans. Goldbeaters' skins will be used for the gas container of the ZR3 and in this connection it is of interest to note that over a half million head of cattle will make their contribution toward the completion of the mammoth airship.

The ZR3 will be so constructed that it will be possible to use either helium or hydrogen for inflation. When the ship is delivered to this country it will be inflated with helium gas thereby obviating all possibility of it meeting the fate of the ill-fated ZR2 and the Roma.

The German government is supplying the ZR3 to this country in accordance with terms of reparations and its delivery will take the place of two smaller airships which were to have been surrendered to the United States but which were illegally destroyed by Germany after the Armistice. The contract with the Zeppelin Airship Co. was recently signed by Germany. It is expected that the work of constructing the giant rigid will take approximately a year and a half.

Admiral Moffett on Aerial Inspection Tour—Rear Admiral William A. Moffett, Chief of the Bureau of Aeronautics, has just completed an aerial inspection tour which covered naval aviation activities centering around Hampton Roads and Chesapeake Bay. These activities at the present time are so numerous and spread over such distances, that only by the use of seaplanes can the Chief of Bureau keep in active touch with the aviation units and at the same time transact the business of the Bureau at his desk in Washington.

Admiral Moffett left the Naval Air Station at Anacostia, D. C., with Lieut. Comdr. E. W. Spencer, U.S.N., in a F5L scouting seaplane and flew to Yorktown, Va., where the battleship Maryland is conducting exercises with the catapult for launching airplanes, which was recently installed. Launching of planes from the deck of the Maryland was witnessed by a party of high naval officials among whom were the Commander-in-Chief of the Atlantic Fleet, Admiral Hilary Jones, and the captains of the battleships. The Commander-in-Chief was enthusiastic over the development of the catapult and the degree of perfection that had been attained in the operation of it, while Admiral Moffett expressed great satisfaction with the expert manner in which flights were conducted from the battleship deck with the aid of the new device.

"The catapult is no longer in the experimental stage," said Admiral Moffett. "It is as practical and workable as is the torpedo tube used for launching torpedoes from the deck of a destroyer. Furthermore its development by the Navy is a boon to aeronautical activities in the commercial field. The day is not far distant when commercial planes will be shot into the air from the deck of fast mail ships when they are still many miles at sea. Urgent mail and passengers can be speeded into port by seaplane and in this way cut down the elapsed time of passage. This and many other possibilities are opened up by the successful development of the catapult which illustrates the pioneer work that is being done by the Bureau of great benefit to industrial and commercial activities."

* * *

Navy Seaplanes Effect Rescue—A thrilling rescue of the crew of a burning ship by Navy seaplanes came to light in an official report just received in the Bureau of Aeronautics. The rescue was effected off San Diego, Calif., on the morning of July 6, when five men who comprised the crew of the Nisshin were taken from the water by a seaplane from the Naval Air Station after they had been severely burned and forced to leap overboard from the burning vessel.

The Nisshin, which was engaged in coastal and fishing trade on the California coast, was about ten miles at sea at the time the fire started. She was observed by Lieut. H. T. Stanley, U.S.N., who at the time was engaged in a practice flight in a combat (land) airplane. Lieutenant Stanley reported that he saw the Nisshin suddenly become enveloped in flames and making for the vessel observed the members of the crew leap into the water. Being unable to land on the water, Lieutenant Stanley headed at once for the Air Station and with open throttle speeded on a race with death. When the combat plane arrived at the hangars on North Island, all available seaplanes were secured in the sheds, but within ten minutes a large F5L scouting plane had been launched and was on her way to the rescue of the mariners.

Upon arrival on the scene great difficulty was experienced by the pilot of the seaplane, Lieut. R. L. Fuller, U.S.N., in maneuvering to pick up the crew of the burning ship and at the same time keep clear of the vessel. She was a seething mass of flames, and in addition presented the possibility of immediate explosion. The exhausted crew were clinging to bits of wreckage in the vicinity and two of the men were so badly burned that they were almost unconscious and were supported in the water by their comrades. Members of the crew of the seaplanes jumped overboard with lines, swam to the suffering men and brought them back to the plane where they were placed on board and first aid rendered by the pilot. The plane was then headed toward the shore and landed at North Island twenty minutes after its departure. A waiting ambulance from the Naval Air Station Dispensary removed the men to the Station hospital for treatment.

Naval Orders—Lieut. Myron F. Eddy, R. F., det. Air Sqds. Pac. Flt.; to home, HDAS.

Lieut. (j.g) Albert P. Burleigh, det. U.S.S. Utah; to Nav. Air Sta. Pensacola, Fla.

Ens. Jack H. Shafer, det. U.S.S. Tennessee; to Air Sqds. Pac. Flt. for duty.

Ens. William F. Skyles, det. U.S.S. Maryland; to Air Sqds. Atl. Flt.

Ens. Earl B. Wilkins, det. U.S.S. Idaho; to Air Sqds. Pac. Flt.

Lieut. Grady B. Whitehead, det. Nav. Air Sta. Pensacola, Fla.; to R. Barracks Hampton Roads, Va.

Ens. Caleb J. Coatsworth, det. U.S.S. Texas, to duty Air Sqds. Pac. Flt.

Ens. Myron F. Eddy, to duty Air Sqds. Pac. Flt.

Ens. Joseph H. Gowan, det. U.S.S. Oklahoma; to Air Sqds. Pac. Flt.

Ens. Dorris D. Curley, det. U.S.S. Arizona; to duty Air Sqds. Pac. Flt.

Ens. Joseph E. Bolt (S.C.), det Navy Yard N. Y.; to duty with supply officer U.S.S. Altair.

Comdr. John Rodgers, det. off. in charge Nav. Rec. Sta. Baltimore, Md., to duty Nav. Air Sta. Pearl Harbor, T. H.

Ens Matthias B. Gardner, to Air Sqds. Pac. Flt.

Lieut. Ira D. Spaulding, R. F., previous orders revoked, det. Nav. Air Sta. Pensacola, Fla.

Lieut. (J.G.) Geo. W. Davis, det. Nav. Aircraft Fact. Phila. to course instruction Supply Corps School of Application.

Capt. Walter R. Gherardi, det. Bu. Navigation, to duty Cdr. Air Sqds. Atl. Flt. and add. duty Cdr. U.S.S. Wright.

Capt. Alfred W. Johnson, det. duty Cdr. Air Sqds. Pac. Flt., to duty Bu. Navigation.

Lt. Robert D. Kirkpatrick, det. Nav. Air Sta. Pearl Harbor, T. H., to Cdr. Air Sqds. Pac. Flt. for duty involving actual flying in aircraft.

Lieut. George W. Plaisted, det. Nav. Air Sta. Pensacola, Fla., to temp. duty 13th Nav. Dist.

Ens. William Richardson, auth'd report Comdt. Nav. Air Sta. Pensacola, Fla., for active duty for training 6 mo.

Lieut. Theodore S. Coulburn, S. C., det. duty Navy Yard Phila., to duty as supply, disbursing and commissary officer Nav. Air Sta. Coco Solo, C. Z.

Coming Aeronautical Events

AMERICAN

Date Postponed — *Aviation Meet, Aircraft Exhibition and Aeronautical Congress, Chicago.*

Oct. 7 — *Detroit Aerial Water Derby, Detroit. (Curtiss Marine Flying Trophy Competition.)*

Oct. 12-14 — *Detroit Aerial Derby, Detroit. (Pulitzer Trophy Race.)*

FOREIGN

August — *Coupe Jacques Schneider. (Seaplane speed race.) Naples, Italy.*

August — *Tyrrhenian Trophy. (International Seaplane Competition.) Naples, Italy.*

Aug. 6 — *Gordon Bennett Balloon Race, Geneva, Switzerland.*

Aug. 6-20 — *Soaring and Gliding Competition, Clermont-Ferrand, France.*

Aug. 9-24 — *Soaring and Gliding Competition, Gersfeld, Germany.*

September — *Grand Prize of Italy. (International Airplane Competition.) Milan, Italy.*

Sept. 22 — *Coupe Henri Deutsch de la Meurthe. (Airplane speed race.) France.*

American elimination trials, if required, to be held about Aug. 15, at Mitchel Field, L. I.

October — *International Parachute Competition. Rome, Italy.*

Foreign News

Roumania—The Roumanian Government has at last awakened to the importance of aviation from a national defense point of view, and considerable development has taken place recently in the military air service. Sixty modern machines, mostly of the DH9 type, have been purchased from a British firm, and delivery has already been made of most of these, which are being distributed among the flying schools of the country.

Since that date a batch of ten airplanes of the Brandenburg type has been manufactured by the National Aircraft Factory, near Bucarest; these are the first native machines in Roumania, and their final tests have been entirely satisfactory. The cost price of these machines has been reduced to 285,000 lei with a 220 hp. engine, whereas if they had been ordered from abroad they would have cost at least one and a half million lei. The King was present at the baptism ceremony of this first batch of Roumanian airplanes, and the Metropolitan of Bucarest himself performed the necessary rites.

In the matter of civil aviation, the month of July is to see the inauguration of the long-postponed Paris-Bucarest passenger air service. For the wedding of Princess Marie and King Alexander of Jugo-Slavia, a special advance service was run in connection with this line from Budapest to Belgrade. An airport, which should become one of the most important in Europe, is in course of construction on the Plateau of Boneasa, two kilometers from the best residential quarter of Bucarest. Plans have been drawn up for the construction of a garden suburb complete with hotel and country club on this plateau.

* * *

Great Britain—The London terminal airdrome at Croydon is beginning to look like a passenger quay at a thriving seaport. Six air lines are now in possession of offices which include accommodation for waiting passengers, in the vicinity of the Customs House, and altogether the approach to the landing ground presents a most business-like appearance. The London-Paris services are being further augmented, while a morning and afternoon service, each way, is arranged between London-Rotterdam and Amsterdam. The new subsidized British service is now operating one machine each way daily between London and Brussels.

As a spectacle the airplane racing at the Royal Aero Club's Third Croydon Aviation Meeting, recently held at Waddon airdrome, was better than anything of the kind since the war.

A good program was carried through with fair punctuality, in spite of two interruptions due to the arrival of four or five machines with passengers from the continent.

* * *

Russia—According to a Stockholm newspaper, General Lazarew, of the late Imperial Russian army, who held important commands during the war, has been appointed chief of the Russian air force. General Lazarew recently reintegrated in Russia and made his submission to the Soviet regime. His appointment strengthens the belief that Soviet Russia intends making a great effort toward reorganizing its air force on modern lines. In this connection it is interesting to note the paragraph devoted to aircraft in the text of the German-Russian secret treaty published by the London *Daily Mail*, which says: "In addition to those already supplied, the German General Staff undertakes to deliver as soon as possible 500 more new airplanes of the Junkers type, with a corresponding number of spare parts."

* * *

Argentina—From Dec. 17 to Jan. 16, the first months' operation of the air route from Buenos Aires to Montevideo, 113 passengers were carried and 10 extra trips were made in addition to the regular bi-weekly service.

* * *

Brazil—Two lines of aerial navigation under federal control are to be inaugurated Sept. 7, 1922, between Rio de Janeiro and Porto Alegre, capital of Rio Grande do Sul.

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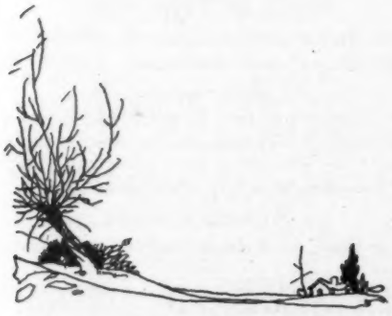

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INDEX TO ADVERTISERS

A

Aeromarine Engineering & Sales Co..... 115
Aircraft Service Directory..... 138

C

Classified Adv..... 136
Chicago Aeronautical Bureau..... 126-127
Curtiss Aeroplane & Motor Corp..... 116

D

Dayton Wright Co..... 135
Diggins, Ralph C., Co., The..... 136

J

Johnson Airplane & Supply Co..... 137

L

Levy Aircraft Co., James..... 136
Lincoln Standard Aircraft Corp..... 136

M

Martin, The Glenn L., Co..... 140

P

Packard Motor Car Co..... 114

T

Thomas-Morse Aircraft Corp..... 117
Thurston, W. Harris & Co., Inc..... 704

W

War Department..... 137
Warner, Edward P..... 136
Wellington, Sears & Co..... 136
Where to Fly..... 134
Wright Aeronautical Corp..... 118

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